

REMARKS/ARGUMENTS

By the present amendment, claims 42, 53, 60 and 61 have been amended as described below and non-elected claims 68 and 69 have been withdrawn.

The amendments to the claims have been made without prejudice and without acquiescing to any of the Examiner's objections. Applicant reserves the right to pursue any of the deleted subject matter in a further divisional, continuation or continuation-in-part application. No new matter has been entered by the present amendment and its entry is respectfully requested.

The office action dated October 16, 2007 has been carefully considered. It is believed that the amended claims and the following comments represent a complete response to the Examiner's rejections and place the present application in condition for allowance. Reconsideration is respectfully requested.

Restriction Requirement

The Examiner confirms the election of Group I comprising claims 42-67. Consequently, non-elected claims 68 and 69 have been withdrawn. However, we disagree that claims 51-55 and 62 should also be withdrawn as these claims are contained within the elected invention although they do not contain the elected species of carp growth hormone. However, election of species does not limit the scope of the claim but rather provides a starting point for the Examiner's search. Based on the Examiner's objections discussed below, it appears that the Examiner has examined the full scope of the claims and therefore Applicant should not be requested to withdraw claims 51-55 and 62.

Oath and Declaration

The Examiner has objected to the oath for two reasons. First, the Examiner comments that the oath does not identify the address of each inventor. We point out that this information was provided on the Application Data Sheet that accompanied the oath. We are enclosing a second copy of the Application Data Sheet for the Examiner's records. Second, the Examiner comments that the Declaration is not dated. The

Declaration that was used is Form PTO/SB/01A that is prepared by the USPTO and is to be used for Utility Application Using An Application Data Sheet. This form does not require a date of execution and therefore the objection should be withdrawn.

Claim Objections

The Examiner has objected to claims 42, 60 and 61 in view of the term "gene". In response, these claims have been amended in order to remove the term "gene" which overcomes the objection. For consistency, the term was also removed from claim 53.

35 USC §112, Second Paragraph

The Examiner has objected to claims 42, 60 and 61 under 35 USC §112, second paragraph, as being indefinite in view of the phrase "sufficient portion". We respectfully disagree with the Examiner for the reasons that follow.

The term "sufficient portion" is used in the phrase "a sufficient portion of an oil body protein to provide targeting of the fusion polypeptide to a lipid phase". Therefore, the phrase is used in the context of an oil body protein that can target to a lipid phase. The application as filed provides sufficient guidance as to what portions of an oil body protein are sufficient for targeting heterologous proteins. In this regard, we refer to page 22, line 23 through to page 23, line 2. One of skill in the art would readily understand what is meant by the phrase, especially with reference to the application. Further, this phrase is used in 8 issued patents to the Applicant and therefore it was not deemed indefinite by the Patent Office in those cases. The 8 patents are: 5,650,554; 5,856,452; 5,948,682; 6,288,304; 6,750,046; 6,753,167; 7,091,401 and 7,098,383.

In view of the foregoing, we respectfully request that the objection to the claims under 35 USC §112, second paragraph, be withdrawn.

35 USC §112, First Paragraph

(a) Enablement

The Examiner has objected to claims 42-50, 56-61 and 63-67 under 35 USC §112, first paragraph, as lacking enablement for any chimeric nucleic acid sequence encoding a fusion polypeptide comprising any nucleic acid sequence that encodes a "sufficient portion" of an oil body protein or any oleosin of undefined structure in any host cell. We respectfully disagree with the Examiner for the reasons that follow.

(i) Sufficient Portion

As mentioned above, the term "sufficient portion" when used in relation to an oil body protein being able to target to a lipid phase would be readily understood by one of skill in the art, especially with reference to the present application. Further, this term has been used in many of Applicant's patents and patent applications and has been allowed in at least 8 cases noted above.

As the Examiner is aware, in order for a claim to be enabled, the disclosure must contain sufficient information to enable one skilled in the art to make and use the claimed invention. The standard to be applied is whether or not the experimentation needed to practice the invention is undue or unreasonable. The fact that experimentation is required or even that it may be complex does not necessarily make it undue. One of skill in the art could readily practice the method recited in the claims with any oil body protein without undue experimentation. One of skill in the art could readily determine what portion or fragment of an oil body protein would be "sufficient" to allow targeting to the oil bodies. For example, if the oil body protein was obtained from a plant, one would know that the hydrophobic central domain of the oil body protein would be necessary to provide targeting to the oil body. This is taught on page 22, lines 23-25. The specification also teaches that the N-terminus of the plant oil body protein should also be included. This is taught on page 22, lines 30-31. With respect to other oil body proteins, one of skill in the art could readily determine what portion of the oil body protein would be useful in targeting to a lipid phase. Such a determination would require routine rather than undue experimentation.

The Examiner confirms that the application does enable the use of the full length oleosin. We disagree that only the full length oleosin is enabled as the application clearly teaches the use of fragments of the oleosin on page 22 as mentioned above. In addition, the inventors have confirmed that the full length oleosin is not required for targeting of heterologous proteins to the oil bodies. In particular, they have demonstrated that removal of the C-terminal domain of oleosin had no effect on the targeting (van Rooijen and Moloney, Plant Physiology, vol. 109, issue 4, 1353-1361, 1995). Further the application demonstrates that another oil body protein, caleosin, can be used to target a heterologous protein to the oil bodies (see Example 22).

In support of the lack of enablement objection, the Examiner cites Li et al. (J. Biol. Chem., 2002, Vol. 277 (40):37888-37895). The Examiner notes that Li et al. teaches that there are more than 40 different oleosins comprising a characteristic central hydrophobic domain of 70-75 uninterrupted and uncharged residues. However, Li supports the enablement of the present claims as Li et al. states on page 37888, last 4 lines of the second column, that "oleosins have recently been proposed as a carrier for the expression of purification of recombinant pharmaceutical peptides and industrial enzymes". In making that statement, Li et al. references two scientific publications of the present inventors. Therefore, Li et al. confirms the function of oil body proteins in targeting recombinant polypeptides to a lipid body.

(ii) Any Host Cell

The Examiner is of the opinion that the application is only enabling for preparing a recombinant polypeptide in a plant host cell. We respectfully disagree with the Examiner as the application provide ample disclosure as to how one skilled in the art could prepare a recombinant protein in any host cell, for example, as described on page 15, line 29 through to page 17, line 20. In addition, the application has data showing the expression of a chimeric nucleic acid molecule in plants (see Examples 3, 4 and 16), bacteria (see Example 18) as well as fungi (see Example 19). In addition, the application provide guidance on page 73, line 22 through to page 74, line 16, as to how

one could prepare the chimeric nucleic acid molecules in mammalian cells. As further support for the enablement of mammalian cells, we enclose an article by Hope et al. (The Journal of Biological Chemistry, Vol. 277, No. 6, p. 4261-4270, 2002) which discloses that plant oil body proteins can be expressed in mammalian cells. In particular, in Figure 4, it is demonstrated that oleosins can be expressed in two different types of mammalian cells, Huh7 cells (hepatocellular carcinoma cells) and BHK C13 cells (fibroblasts).

The Patent Office bears the initial burden to establish a basis to object to the enablement of a claim. With respect, the Examiner has not provided any specific technical reasons to support why the application does not enable any portion of an oil body protein or any host cell. Specific technical reasons are required (MPEP §2164.04). Therefore, the Patent Office failed to meet its initial burden of showing lack of enablement.

In view of the foregoing, we respectfully request that the objections to the claims under 35 USC §112, first paragraph as lacking enablement, be withdrawn.

(b) Written Description

The Examiner has objected to claims 42-50, 56-61 and 63-67 under 35 USC §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. We respectfully disagree with the Examiner for the reasons that follow.

(i) Sufficient Portion

The Examiner is of the opinion that the application as filed does not provide an adequate written description of a "sufficient portion" of an oil body protein or any oleosin of undefined structure necessary for the functional activity of said oil body protein. Applicant is not attempting to claim any portion of an oil body protein *per se*, but is rather claiming a method of preparing a heterologous polypeptide by using a sufficient

portion of the oil body protein that can target the heterologous polypeptide to a lipid phase.

As the Examiner notes, the written description requirement for a claimed genus may be satisfied through sufficient description of a representative numbers of species by actual reduction to practice or by disclosure of relevant identifying characteristics. In the present case, Applicant has demonstrated actual reduction to practice of the claimed method using three oil body proteins. Two of the oil body proteins are oleosins and one is a caleosin. In addition, Applicant has provided the disclosure of the identifying characteristics required to satisfy the term "sufficient portion". In particular, Applicant notes on page 22, lines 23 through to page 23, line 2, regarding what portions may be sufficient for targeting when using plant oil body proteins. The fact that oil body proteins share common identifying characteristics is known in the art as evidenced by the Li et al. article by the Examiner.

In addition, the application as filed also provides information regarding other oil body proteins other than plant oil body proteins that may be used in the claimed method including ones from fungi, insects and animals. See page 21, lines 9-18 of the application as filed.

2. Any Host Cell

The Examiner is of the opinion that the application as filed does not have an adequate written description for any host cell. We respectfully disagree with the Examiner as Applicant has provided actual reduction to practice of three different host cells; plants, bacteria and fungi, as well as a description as to how the invention may be practiced in animal cells. Further, there is ample written description regarding how the invention can be carried out in various host cells, for example, page 15, line 29 through to page 17, line 20. Therefore, the application as filed is clear in disclosing that the method can be carried out in any host cell.

The Patent Office has the initial burden of providing evidence as to why a person skilled in the art would not have recognized that the disclosure contains a description of the invention. As noted in MPEP §2163A, there is a presumption that the claims satisfy the written description requirement. The present application clearly conveys that the inventors had possession of a "sufficient portion of an oil body protein" to provide targeting of a heterologous protein to "any host cell".

In view of the foregoing, we respectfully request that the objections to the claims under 35 §112, first paragraph as lacking written description, be withdrawn.

Double Patenting

The Examiner has objected to claims 42-50, 55, 57, 58-60, 61 and 63-67 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9, 16, 29, 31 and 32 of U.S. Patent No. 5,650,554; claims 42-50, 55, 56, 57, 58-60, 61 and 63-67 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9, 13-19, and 21-26 of U.S. Patent No. 6,753,167; claims 42-50, 55, 57, 58-60, 61 and 63-67 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9, 12-15 and 17-19 of U.S. Patent No. 5,948,682; and claims 42-46, 47-50, 55, 56, 57, 58, 59, 60, 61, 63 and 65-67 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 and 9-11 of U.S. Patent No. 6,288,304. In response, we are enclosing a Terminal Disclaimer against each of the U.S. patents.

The Commissioner is hereby authorized to charge any fee (including any claim fee) which may be required to our Deposit Account No. 02-2095.

In view of the foregoing comments and amendments, we respectfully submit that the application is in order for allowance and early indication of that effect is respectfully requested. Should the Examiner deem it beneficial to discuss the application in greater

detail, he/she is kindly requested to contact the undersigned by telephone at (416) 957-1682 at his/her convenience.

Respectfully submitted,

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